

What we claim:

1. An optical disk apparatus for recording data on a disk by light, and reading the data recorded on the disk by utilizing a difference in reflectance,  
5 wherein the disk apparatus scrambles data by an arbitrary seed to be written on the disk.
2. An optical disk reproducing apparatus for reading data recorded on a disk by utilizing a difference in reflectance, wherein the disk reproducing  
10 apparatus descrambles the data scrambled by an arbitrary seed without a seed.
3. A method of scrambling data in an optical disk apparatus adapted to record data on a disk by light and read the data recorded on the disk by utilizing a  
15 difference in reflectance, comprising the steps of: adding seed data for scrambling to an original data to be recorded on the disk; and determining one-bit scrambled data by using one-bit original data or seed data, and multiple-bit past scrambled data.
- 20 4. The optical disk apparatus according to claim 1, further comprising: means for generating a fixed scrambled bit string with a period longer than that in a mode used in the scrambling; and a means for performing exclusive OR operation of an original data  
25 and every bit.
5. The optical disk reproducing apparatus according to claim 2, further comprising: a means for generating a fixed scrambled bit string with a period

longer than that of a mode for determining descramble;  
and a means for performing exclusive OR operation of  
data descrambled by descrambling and every bit of the  
bit string.

5           6. The optical disk apparatus according to claim  
1, further comprising: a means for adding an error  
correcting code to the scrambled data after the  
scrambling; and a means for writing data to which the  
error correcting code is added on the disk.

10          7. The optical disk reproducing apparatus  
according to claim 5, further comprising: a means for  
correcting an error of data read from the disk; and a  
means for descrambling the data subjected to error  
correction.

15          8. The optical disk apparatus according to claim  
1, further comprising: a means for performing exclusive  
OR operation of M-sequence data obtained by scrambling  
seed data only and every bit of the data to conduct re-  
scrambling.

20          9. The optical disk apparatus according to claim  
1, wherein the seed data is placed immediately in front  
of a fixed SYNC pattern, and seed data to be used is  
previously determined depending on the position in a  
sector.

25